

REMARKS

Claims 1-29 are pending in the application. Claims 1 and 3-5 are rejected. Claims 2 and 6-12 are objected to but would be allowable if placed in independent form. Claims 13-29 are allowed.

Response to Appeal Brief

Applicants are grateful that the Examiner has accepted many of the arguments set forth in Applicants' Appeal Brief and has allowed claims 13-29 and has indicated that claims 2 and 6-12 would be allowable if place in independent form. The Examiner has cited new prior art, as discussed below, and rejects claims 1 and 3-5. On the basis of the following comments, Applicants believe that these claims also should be found allowable.

Claim Rejections - 35 U.S.C. § 103

Claims 1 and 3-5 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Onderkirk et al (5,828,488) in view of Sanelle et al (6,181,394). This rejection is traversed for at least the following reasons.

The Invention

The present invention is an optical path changing polarizer that is particularly applicable to a light-distributing structure for use with a liquid-crystal display device where light incident on one side of the device is changed to a viewing direction in a highly efficient manner. The invention of claim 1 is focused on the optical path changing polarizer that provides such change in light direction. With reference to Figs. 1A-1I, claim 1 concerns an optical path changing polarizer (1) with a polarizer (P), comprising layers 12-14 and having on one side thereof an adhesive layer (15) and on the other side a repetitive prismatic structure (11A). As claimed, the adhesive layer (15) has a refractive index different by 0.1 or less from a refractive index of the adjacent polarizer surface layer. In addition, as claimed, the prismatic structure (11A) has optical path changing slopes that are inclined with an inclination angle in a range from 35° to 48° with respect to a plane of the polarizer. The prismatic layer is formed on a surface that is not attached to the polarizer, as is clear from Figs. 1A-1I.

Claim 3 states that the inclination angle of each of the slopes with respect to the polarizer plane is in a range of 38-45°. Notably, claim 3 does specify that each of the optical path changing slopes falls within this range.

Claim 4 specifies that the path changing slopes are formed into a structure of grooves, each substantially triangular shaped.

Claim 5 specifies that the optical path changing slopes are formed into a structure of grooves or protrusions each having one of a substantially tetragon shape or a pentagon shape in section.

Onderkrik et al

The Examiner relies upon Onderkirk et al for a teaching in Fig. 13 of an optical path changing polarizer that includes a polarizer layer 116 and a repetitive prismatic structure 113. Although not expressly described in the text at col. 10 that relates to Fig. 13, the Examiner asserts that the prismatic structure has slopes with an inclination angle in a range of from 35° to 48° with respect to the plane of the polarizer. The Examiner also asserts that the prismatic structure is on one side of the polarizer but admits that Onderkirk does not teach an adhesive layer disposed on the other side of the polarizer, particularly an adhesive layer having the claimed refractive index.

Sanelle et al

The Examiner must look to Sanelle et al for a teaching of the use of an adhesive layer in a sandwiched structure 11 for an active matrix liquid crystal display panel. The Examiner points to a front polarizer 31 in Sanelle et al and notes that this structure has on one side thereof an index matched adhesive 37. The Examiner fails to note, however, that the opposite side of the polarizer has an index matched bonding material 33 that itself is attached to a glass substrate 13. There is no teaching of a repetitive prismatic structure on the opposite side of the polarizer, or anywhere else in Sanelle et al. In short, Sanelle et al is not concerned with redirecting light, as in the present invention and in Onderkirk et al.

In addition to the deficiencies in Onderkirk that are admitted by the Examiner, Applicants further note that the reflective polarizer body is illustrated in Fig. 13 with a space between the polarizer body 116 and a crystal matrix 147 in the direction of the observer 146. Similarly, on

the opposite side of the polarizer body 116, the element 113 with structure surface 112 is separated by an air space. A similar space is described as a “gap” 171 with respect to the structure of Fig. 10. Thus, Applicants respectfully submit that the structure relied upon by the Examiner does not contemplate use of adhesives.

Applicants do note, however, that Fig. 14 illustrates an optically structured layer 113 that is replicated on a polymer layer cast onto the reflective polarizer body 116 (col. 11, lines 8-21). This unitary structure is formed by attaching two films, such as heat lamination or a casting and curing the structured material. However, again, there is no teaching with regard to an adhesive on the opposite side of the polarizer 116.

Accordingly, neither of the cited references alone, or taken together, teach the claimed invention.

Claim 5 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Onderkirk et al (5,828,488) in view of Sanelle et al (6,181,394) and further in view of Hira (4,961,198). This rejection is traversed for at least the following reasons.

The Examiner admits that Onderkirk et al and Sanelle et al do not teach protrusions shaped like a tetragon or a pentagon in section. However, the Examiner looks to Hira, particularly, Figs. 20A, 20C and 21A-21C for such teaching. The Examiner concludes it would have been obvious to one skilled in the art to modify Onderkirk in view of Sanelle to have such shapes as taught by Hira et al.

Applicants respectfully submit that the present invention is patentable for the reasons given for the parent claim 1, as Hira does not remedy the deficiencies of the Onderkirk et al and Sanelle et al references.

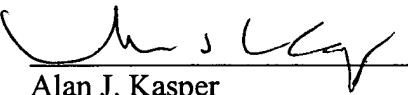
Allowable Subject Matter

Claims 2 and 6-12 are considered allowable if placed in independent form. Applicants have amended the claims accordingly. Claims 13-29 are allowed.

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,



Alan J. Kasper

Registration No. 25,426

SUGHRUE MION, PLLC
Telephone: (202) 293-7060
Facsimile: (202) 293-7860

WASHINGTON OFFICE

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